REMARKS

Responsive to the Official Action mailed November 6, 2002, Applicant respectfully requests reconsideration, reexamination and allowance of claims 1-21 in view of the above amendments and the following remarks.

The Examiner has first rejected claims 1-20 under 35 USC § 112, first paragraph on the grounds that the specification, although enabling for powder coating plastic articles does not reasonable provide enablement for powder coating any substrates, such as metallic or ceramic materials. The Examiner has also noted various inconsistencies in the claims, vis singular and plural uses of the term article and the state of the article following one or more of the recited method steps.

Applicant has amended the independent claims to indicate that the presently claimed invention is directed to a method for powder coating plastic injection molded articles. Applicant has also amended the claims to make consistent use of the singular term "article" rather than the plural term "articles", and has, as appropriate, indicated the state of the article for clarity, as requested by the Examiner. To this end, applicant submits that the Examiner's concerns as noted in paragraphs 1-4 of the Official Action have been addressed, and respectfully requests that the Examiner withdraw these bases for rejection of the claims.

As to the substantive rejections, the Examiner has rejected claims 1-4, 17 and 17 under 35 USC §102(b) as being anticipated by Leach, U.S. Patent No. 5,338,578. The Examiner characterizes Leach as disclosing powder coating reinforced plastic resin substrates comprising the steps of washing/cleaning the substrate followed by drying to remove wash water and heating the cleaned article to a temperature to cause degassing at a temperature of at least the melting point of the powder to be applied. The Examiner further characterizes Leach as disclosing powder coating "by any conventional powder coating technique" whereby the powder melts and flows at the surface and then further heating at elevated temperatures above the powder cure temperature to initiate cross-linking and curing. In support of this characterization, the Examiner cites to column 4, line 61 to col. 5, line 45. The Examiner states further that powder coating

materials include epoxy/polyester/and acrylic powder coating resins. The Examiner asserts that it is inherent that the final, cured powder coated product remain undistorted or melted to maintain its viability as a coated product, which is clearly the case in Leach, such that the temperatures cited must be less than the melting point of the plastic substrate.

The Examiner has next rejected claims 5-11 and 18-19 under 35 U.S.C. §103(a) as unpatentable over Leach. The Examiner cites Leach for the same reasons set forth earlier in the Action, admitting, however, that cooling of the cured coated article and plural coatings are not taught by Leach. Nevertheless, the Examiner concludes that as to claim 5, cooling of the article would have been an obvious necessity within the purview of one of ordinary skill in the art in order to give the final article utility since clearly a heated coated article in an oven has no utility and that obviousness may be based upon "common knowledge" and "common sense" of the person of ordinary skill.

Next, the Examiner rejected claims 6-11 and 18-19, stating that although Leach does not explicitly teach the detailed steps of a second coating, it does disclose (in column 6 at line 13), that optionally an additional resin coating comprising acrylics, polyesters, etc may be applied, without further limitation. The Examiner concludes that the reference discloses applying a second coat without limitation as to method, and applying a first coat of the same/similar composition. Thus, is the Examiner's position that one of ordinary skill would have recognized the utility of applying a second coating onto the coated substrate using coating steps similar to the first coating in order to achieve the recognized benefits of high gloss finish and a surface free of defects due to trapped gasses.

As to claims 15-16, the Examiner has taken the position that Leach teaches the use of carboxylic acids group- containing polyester coating powders which is synonymous with the claimed "carboxyl polyester", and that Leach also teaches that curing times and temperatures vary depending on the powder coating composition, e.g. at least 250 F, preferably 250-375 F, and further that preheating is carried out at 150-300 F. The Examiner states that these ranges overlap or are close to those of claims 15-16 and that the subject matter as a whole would have

been obvious to one of ordinary skill in the art at the time the invention was made if the overlapping portion of the ranges disclosed by the reference were selected, because overlapping ranges have been held to be a prima facie case of obviousness. The Examiner states further that differences such as a curing temperature of "about 400 F" are obvious variations which reflect either differences in coating material, substrate size, etc or the fact that time/ temperature are related cause-effective variables such that equivalent results can be obtained by simply increasing times at lower temperatures, or vice- versa. Thus, the Examiner concludes that such variations do not patentably distinguish over the prior art because they are variations within the purview of one of ordinary skill, and that it would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the method of Leach and to modify times, temperatures, and other conventional variables to achieve a desired end coating because such variations would have been within the purview of one of ordinary skill.

The Examiner has next rejected claims 12-13 rejected under 35 U.S.C. 103(a) as being unpatentable over Leach in view of Anderson et al., U.S. Patent No. 5,516,551. The Examiner cites Leach for its teachings as characterized above, but states that application of the powder by electrostatic spraying is not disclosed. The Examiner cites Anderson et al., for its teaching a similar method of powder coating reinforced plastic substrates with similar coating powders in which the substrate is preheated, resin powder is applied to a preheated substrate below the powder cure temperature, and then heating the powder coated substrate at or above the curing temperature for a time sufficient to substantially cure the powder, and for its explicit notation that temperatures used must not degrade, deform, or damage the articles. As characterized by the Examiner, powder is applied "in any conventional manner such as by spraying and preferably by electrostatically applying the powder coating". The Examiner concludes that since Leach teaches to apply the powder by conventional methods, and Anderson et al. teach the conventionality of applying such powders to similar substrates by electrostatic powder coating, that it would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the method of Leach by using electrostatic powder coating means as taught by Anderson et al.

because such means are demonstrated to be conventional for applying such powders to the plastic substrates.

Last, the Examiner has rejected claims 20-21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Leach. The Examiner states that the cured powder coated article of Leach would have been expected to be the same as, or only slightly different from, the articles of the product by process claims and that the determination of a product is based upon the product itself and not by the method of production.

Applicant has, as noted above, amended independent claims 1 and 18 to more particularly point out and distinctly claim the subject matter of the invention. Specifically, applicant has amend these claims to indicate that the present invention is directed to a method for powder coating a plastic injection molded article. The method includes the steps of preheating the article to a preheating temperature and substantially completely degassing the article. The preheated and degassed article is then coated with a polymeric powder coating that has a cross-linking temperature that is above the preheating temperature. The powder coating softens and adheres to the preheated and degassed article. The article having the powder coating applied thereto is cured at a curing temperature that is between the powder coating cross-linking temperature and the melting point temperature of the article. The method produces a coated and cured degassed plastic injection molded article.

As to the Application of Leach to the presently claimed invention, Application submits that Leach is clearly directed to resolving problems quite unlike those resolved by the present invention. First, Leach teaches the coating of low density, fiberglass reinforced polyester type plastic substrates. Particularly addressed by Leach are compression molded substrates, i.e., bulk molded substrates (BMCs) and sheet molded substrates (SMCs) having a low density achieved by the use of a hollow filler. Typically, these types of plastics are characterized by a lower surface quality, by which is meant a "rougher" texture and appearance. This is due, in part, to the nature of the fiber or spheres that are a large constituent of the plastic material. To this end, it is

Applicant's position that Leach is more concerns with "sealing" rather than coating as in the presently claimed invention, and Leach is concerned with low density plastics, rather than the claimed injection molded plastic articles. Moreover, the Leach sealing is, Applicant submits, only a precursor to a later coating step that is, in part, disclosed in Leach, the coating providing a visually acceptable appearance that is not provided by the sealing method more fully disclosed in that patent.

Further and to this end, Leach does not teach substantially completely degassing the part. Rather, as provided in Leach:

> "[t]he part may then be passed through an oven at a temperature of from about 150°F to about 300°F and preferably about 180°F to about 250°F to remove surface water which results from the power wash step. . . . Accordingly, the temperature of the substrate is elevated to a temperature which will initiate and achieve a partial degassing . . . The powder coating will melt and flow out upon contact with the substrate surface giving a uniform smooth liquid surface which bridges over or fills any voids in the substrate surface generated during the partial degassing." (Leach et al., col. 4, line 64 - col. 5, line 13).

Moreover, as provided in the background discussion of Leach et al.:

> "[i]n contrast to the present invention, the prior art relates to a high temperature preheating treatment of a sample for a period of time sufficient to allow the substrate to degas throughout. This process is longer and therefore more expensive."

Thus, it is Applicant's position that Leach teaches away from the presently claimed method which includes the step of substantially completely degassing the article. Leach's method is a "surface" degassing to minimize the gases that would escape (and mar the sealing) of the gasses at the surface of the article. This is due, in part, to the immediate melting and flowing of the coating (see, Leach et al., col. 5, lines 3-8), and curing (see, col., 5, lines 14-19) of the coating by the initial heating step. Thus, by necessity, Leach teaches preheating to a temperature

above the coating curing temperature.

In contrast, the present method includes a preheating step to substantially completely degas the article. The preheated and degassed article is then coated with a polymeric powder coating that has a cross-linking temperature that is above the preheating temperature. That is, the powder coating softens and adheres to the preheated and degassed article, but cross-linking, e.g., curing has not yet commenced. The article having the powder coating applied thereto is then cured at (e.g., heated to) a curing temperature that is between the powder coating cross-linking temperature and the higher melting point temperature of the article.

Thus, as to the heating of the article, it is Applicant's position that not only does Leach not teach the presently claimed method, but Leach in fact teaches away from the present method in that it would lead one to elevate the temperature of the article above the curing temperature prior to application of the coating.

Turning again to the article itself, applicant would like to point out that on the one hand the articles of which Leach is concerned are formed from thermoform or thermoset materials. These are materials that are "set" at elevated temperatures and as such, can withstand the higher temperature process of Leach. The present invention, on the other hand is directed to articles formed from thermoplastic materials which, as will be recognized by the Examiner are more sensitive to the elevated temperatures taught by Leach. Thus, it is also Applicant's position that if one were to subject the plastic injection molded articles of the present invention to the process disclosed in Leach, the product, a "usable" coated plastic article would not result.

With respect to the rejection of claims 20-21,it is Applicant's position that these claims are allowable over the art of record for the same reasons that claims 1-19 are allowable of the art of record.

In conclusion, applicant respectfully submits that claims 1-21 are in condition for allowance, and such action is earnestly submitted. Applicant believes that there is no fee due in connection with the present Amendment A. If , however, there is a fee due, Applicant authorizes the Commissioner to charge any underpayment, or credit any overpayment, to Deposit Account

No. 23-0920. A duplicate copy of this sheet is enclosed. Should any petitions be necessary, applicant requests that this paper constitute any such necessary petition.

Attached herewith is a paper entitled "SPECIFICATION SECTIONS AND CLAIMS MARKED-UP TO INDICATE CHANGES" and a paper entitled "CLEAN SET OF ALL PENDING CLAIMS FOLLOWING ENTRY OF THE PRESENT AMENDMENT" for the Examiner's use.

If the examiner finds that there are any outstanding issues that may be resolved by a telephone interview, the Examiner is invited to contact the undersigned at the below listed number.

Respectfully submitted,

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CLAIMS MARKED-UP TO INDICATE CHANGES

1. A method for powder coating a plastic injection molded article[s] comprising the steps of:

preheating the article to a preheating temperature;

substantially completely degassing the article;

coating the preheated and degassed article with a polymeric powder coating, the polymeric powder coating having a cross-linking temperature that is above the preheating temperature, the powder coating softening and adhering to the preheated and degassed article; and

curing the article having the powder coating applied thereto at a curing temperature, the curing temperature being between the powder coating cross-linking temperature and the melting point temperature of the article[s] to produce a coated and cured degassed plastic injection molded article.

6. The method for powder coating in accordance with claim 1 including the step of applying a second coat of polymeric powder coating on the coated and cured article, the second coat of polymeric powder coating having a cross-linking temperature and being applied over the first coating of the powder coating after curing thereof, the second coat of polymeric coating being applied over the first coat of powder coating at a temperature below the cross-linking temperature of the second coat of polymeric powder coating; and curing the article having the second coat of powder coating applied thereto at a curing temperature, the curing temperature of the second coat being between the cross-linking temperature of the second coat of powder coating and the melting point temperature of the article.

18. A method for powder coating a plastic injection molded article[s] comprising the

steps of:

preheating the article to a preheating temperature below a melting point temperature of the article;

substantially completely degassing the article;

coating the preheated and degassed article with a first polymeric powder coating, the first polymeric powder coating having a first cross-linking temperature that is above the preheating temperature, the powder coating softening and adhering to the preheated and degassed article;

curing the article having the first powder coating applied thereto at a first curing temperature, the first curing temperature being between the first powder coating cross-linking temperature and the melting point temperature of the articles;

coating the article with a second coat of polymeric powder coating over the cured first coating, the second coat of polymeric powder coating having a second cross-linking temperature, the second coat of polymeric coating being applied over the first coat of powder coating at a temperature below the second cross-linking temperature; and

curing the article having the second coat of powder coating applied thereto at a second curing temperature, the second curing temperature being between the second cross-linking temperature and the melting point temperature of the article to produce a twice coated and cured degassed plastic injection molded article.

20. A powder coated plastic injection molded article produced in accordance with the method of claim 1.

21. A powder coated plastic injection molded, non-conductive article produced in accordance with the method of claim 1.

CLEAN SET OF ALL PENDING CLAIMS
FOLLOWING ENTRY OF THE PRESENT AMENDMENT

1. (Amended) A method for powder coating a plastic injection molded article comprising the steps of:

preheating the article to a preheating temperature;

substantially completely degassing the article;

coating the preheated and degassed article with a polymeric powder coating, the polymeric powder coating having a cross-linking temperature that is above the preheating temperature, the powder coating softening and adhering to the preheated and degassed article; and

curing the article having the powder coating applied thereto at a curing temperature, the curing temperature being between the powder coating cross-linking temperature and the melting point temperature of the article to produce a coated and cured degassed plastic injection molded article.

2. The method for powder coating in accordance with claim 1 including the step of drying the article at a temperature below a melting point temperature of the article prior to preheating the article.

3. The method for powder coating in accordance with claim 1 including the step of cleaning the article to remove contamination with a wash solution prior to preheating the article.

4. The method for powder coating in accordance with claim 3 including the step of drying the article to remove any remaining wash solution.

5. The method for powder coating in accordance with claim 1 including the step of cooling the coated article subsequent to curing the article.

6. (Amended) The method for powder coating in accordance with claim 1 including the step of applying a second coat of polymeric powder coating on the coated and cured article, the second coat of polymeric powder coating having a cross-linking temperature and being applied over the first coating of the powder coating after curing thereof, the second coat of polymeric coating being applied over the first coat of powder coating at a temperature below the cross-linking temperature of the second coat of polymeric powder coating; and curing the article having the second coat of powder coating applied thereto at a curing temperature, the curing temperature of the second coat being between the cross-linking temperature of the second coat of powder coating and the melting point temperature of the article.

7. The method for powder coating in accordance with claim 6 including the step of preheating the article to a second preheating temperature, the second preheating temperature being below the cross-linking temperature of the second coat of polymeric powder coating.

8. The method for powder coating in accordance with claim 6 including the step of drying the article at a temperature below a melting point temperature of the article prior to preheating the article.

9. The method for powder coating in accordance with claim 6 including the step of cleaning the article to remove contamination with a wash solution prior to preheating the article.

10. The method for powder coating in accordance with claim 9 including the step of drying the article to remove any remaining wash solution.

11. The method for powder coating in accordance with claim 6 including the step of cooling the coated article subsequent to curing the article.

12. The method for powder coating in accordance with claim 1 wherein the coating step includes spraying the powder coating material from an electrically charged device.

13. The method for powder coating in accordance with claim 12 wherein the electrically charged device is an electrostatic spray gun.

14. The method for powder coating in accordance with claim 1 wherein the article is non-grounded during the coating step.

15. The method for powder coating in accordance with claim 1 wherein the preheating temperature is about 220°F to about 250°F and the powder coating is a carboxyl polyester resin based material having a cross-linking temperature greater than about 250°F, and wherein the article is cured at a temperature of about 400°F.

16. The method for powder coating in accordance with claim 15 including the steps of: applying a second coat of polymeric powder coating on the article, the second coat of polymeric powder coating being a carboxyl polyester resin based material having a cross-linking temperature great than about 250°F, the second coat of resin being applied over the cured first coating and being applied at a temperature less than about 250°F; and curing the article having the second coat of resin at a temperature of about 400°F.

17. The method for powder coating in accordance with claim 1 including the step of supporting the article without regard as to electrically grounding the article.

18. (Amended) A method for powder coating a plastic injection molded article comprising the steps of:

preheating the article to a preheating temperature below a melting point temperature of the article;

substantially completely degassing the article;

coating the preheated and degassed article with a first polymeric powder coating, the first polymeric powder coating having a first cross-linking temperature that is above the preheating temperature, the powder coating softening and adhering to the preheated and degassed article;

curing the article having the first powder coating applied thereto at a first curing temperature, the first curing temperature being between the first powder coating cross-linking temperature and the melting point temperature of the articles;

coating the article with a second coat of polymeric powder coating over the cured first coating, the second coat of polymeric powder coating having a second cross-linking temperature, the second coat of polymeric coating being applied over the first coat of powder coating at a temperature below the second cross-linking temperature; and

curing the article having the second coat of powder coating applied thereto at a second curing temperature, the second curing temperature being between the second cross-linking temperature and the melting point temperature of the article to produce a twice coated and cured degassed plastic injection molded article.

19. The method for powder coating in accordance with claim 18 including the step of supporting the article without regard as to electrically grounding the article.

20. (Amended) A powder coated plastic injection molded article produced in accordance with the method of claim 1.

21. (Amended) A powder coated plastic injection molded, non-conductive article produced in accordance with the method of claim 1.